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TRENDS IN EUROPEAN MOUNTAIN BIODIVERSITY: AN INTRODUCTION[1]

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This compilation of papers includes most of the presentations made at the European Science Foundation (ESF) exploratory workshop «Trends in European Mountain Biodiversity – Research Planning Workshop» held at the Centro di Ecologia Alpina at Trento, Italy during 18-20 October 1995. The Workshop sought to bring together researchers from a range of disciplines focused on the mountain areas of Europe. In addition to the presentations, which appear in this volume, six working groups discussed three issues on (a) measuring biodiversity, (b) ecosystem functions and (c) environmental interactions.

The participants defined biodiversity, specified inventory requirements and discussed problems associated with standardisation and quality of existing data. It was agreed that alpine research should focus on climate and land use change impacts and that activities at ecotones were to be of special interest.

With regard to ecosystem functions and the regulation of biodiversity it was agreed that research focus should be on the sensitivity of ecosystems to perturbation such as slope stability, permafrost dynamics, herbivory by large mammals, and insect outbreaks. Research should aim to quantify to what extent biodiversity is regulated by ecosystem processes and the extent to which long-term sustainability is dependent on biodiversity.

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Much emphasis was placed on the variable and unpredictable nature of individual environmental factors for an integrated approach to consider all biotic and abiotic factors affecting the European alpine in a changing climate and social environment was emphasised.

The seven papers in this volume include a range of biodiversity related topics covering European mountains from the south western Atlantic edge to the Kola peninsula in Russia. In the first paper, NAGY presents a major review of European mountain biodiversity. This was originally prepared as a primer document for the ESF Exploratory Workshop, providing a comprehensive overview of mountain biodiversity research in Europe across all geographic areas and disciplines.

BROLL's contribution draws on a wealth of references published over the last century on the diversity of soil organisms and soil ecological processes in different mountain regions of Europe. She highlights topics for future studies, notably the re-sampling of historic study sites to assess changes in the soil fauna and microorganisms, the role of key abiotic processes such as cryoturbation, and the need for identifying indicator organisms, keystone species and functional groups.

COLDEA & CRISTEA report floristic and community diversity in the main grassland and dwarf shrub communities in the sub-alpine and alpine zones in five mountain ranges of the Romanian Carpathians. They have identified geological substratum and pedo-climatic factors as the main determinants of the floristic composition and distribution of 30 plant communities.

The species diversity 'hot spots' which occur north of the Alps in Central Europe's massive landscape of low diversity broadleaf and conifer forest arise as a result of interactions among physical, biotic and historical elements. JENÍK presents this as a model of an anemo-orographic system. Its westerly winds explain the high plant and animal diversity in the corries (glacial cirques) of the Hercynian mountains.

MARTINEZ-RICA reviews some of the richest areas for vascular plants in general and for endemism in particular, in the Spanish and some of the other Mediterranean mountains.

The ecosystems of the Caledonian mountains and their dependence on abiotic factors such as climate and photoperiod are highlighted by SONESSON & MOLAU. They discuss recent work on the likely impacts of climate change on high mountain ecosystems of the Caledonian mountains.

The final paper, by VÄISANEN, focuses on long-term studies with an emphasis on herbivores and their cyclic dynamics in the Nordic countries. He also reviews the likely impacts of pollution in high mountain areas and discusses some problems associated with site protection and land use management objectives.

In several ways, the papers form an ordered sequence with emphasis on the physical sciences but ending in discussions on land-use issues. The principal message is one of a need for integration: we need to have fora with enough biologists and geographers, soil scientists and ecologists, and fundamental and comparative ecologists interacting to develop an understanding of the composition, nature and needs of mountain ecosystems. These papers collectively provide an important foundation for this.

Following this ESF workshop, the principal organiser, Dr. Jennifer Nagy, led an application to the ESF to establish a European research network on alpine/high mountain environments. The application was successful and the Alpine Environment Research Network (ALPNET) was established in 1997. ALPNET is scheduled to produce an overview *'Biodiversity in Alpine Europe'* in 2002.

A number of individuals and organisations helped greatly in the organisation and smooth running of the Workshop. Our gratitude to the late Jennifer Nagy, to whom these proceedings are dedicated, is immense. She showed great vision, energy and determination in preparing various papers and applications and displayed a remarkable ingenuity for pulling together teams of people; her work carries on in the spirit of ALPNET. We are grateful to the European Science Foundation for providing funding for the workshop. Within the ESF we particularly thank Ms Pat Cosgrove, Dr. Peter Coyler, and Dr. Anette Moth-Wiklund. The International Centre for Alpine Research (ICALPE) provided a valuable stimulus for the Workshop and we are particularly grateful to ICALPE's then co-ordinator Dr. Pier-Carlo Zingari for all his work in bringing the Workshop to fruition. The Centro di Ecologia Alpina, Viote del Monte Bondone, Italy served us an outstanding location for the Workshop; we are grateful to its director Dr. G. Nicolini, and to Dr. Claudio Chemini and colleagues for their wonderful hospitality.